Memorandum

U.S. Department
of Transportation

**Federal Aviation
Administration**

Subject: Using SAE ARP5526, Aircraft Seat Design Guidance and Clarifications, in Seat Design Approvals

Date: June 26, 2003

From: Manager, Aircraft Engineering Division, AIR-100
Manager, Transport Airplane Directorate, ANM-100

Reply to
Attn. of:

To: Directorate Managers
Aircraft Certification Office Managers

Recently the Society of Automotive Engineers (SAE) published Aerospace Recommended Practice (ARP) 5526, Aircraft Seat Design Guidance and Clarifications. In coordination with the effort to streamline certification for aircraft seats, industry recommends using SAE ARP5526 to the maximum extent possible by seat suppliers and seat installers in the design and approval of aircraft seats.

SAE ARP5526 provides clarification and documents existing guidance and practice for complying with some of the requirements of the Technical Standard Orders (TSO) and the applicable airworthiness standards for aircraft seats. Using SAE ARP5526 helps to standardize industry recommended design practices and means for evaluating compliance of certain seat features and characteristics to the TSOs and the applicable airworthiness regulations. SAE ARP5526 does not impose additional criteria to show compliance to the aircraft seat TSOs or the applicable airworthiness standards for aircraft seat approvals.

To receive a TSO approval, an applicant must submit a statement of conformance that the article meets the minimum performance standards (MPS) of the applicable TSO. The TSO applicant can use SAE ARP5526 to show compliance with the relevant sections of the appropriate seat TSO. When the TSO applicant chooses to use SAE ARP5526, the information presented with the TSO data package must identify those (SAE ARP5526) sections used.

After issuance of the TSO approval, the TSO holder should ensure that the person(s) performing the installation approval receives all the information concerning the use of SAE ARP5526. Based on the statement of conformance from the TSO holder, and all references to SAE ARP5526, the installer should be able to make a determination of compliance to the relevant sections of 14 CFR part 25.

The statement of conformance may include specific references to SAE ARP5526 or a more general statement. As an example of a more general statement, the seat installer may use a seat interface requirements document (or equivalent document) to require the seat supplier to use SAE ARP5526 in accordance with this memorandum. The seat supplier may then provide a statement, with substantiating test data, that all requirements of the interface document have been met. This statement should be adequate for the installer to make a determination of compliance.

The attached Table 1, "Summary of SAE ARP5526 Guidance Applicability", provides the correlation between SAE ARP5526 and TSO-C39b, TSO-C127, TSO-C127a, 14 CFR part 25, and FAA policy and guidance for the approval of aircraft seats. As an example, when evaluating seat belt misalignment, as required by TSO-C127a, paragraph 3.1.11 and 14 CFR § 25.601, SAE ARP5526 section 3.2.2 provides a satisfactory method for determining compliance to both the TSO and 14 CFR part 25. In addition, SAE ARP5526 section 3.2.3 contains photographic examples that clearly show common design concerns and designs to avoid in seatbelt-to-seat interface.

SAE ARP5526 section 3.11.2 addresses potentially injurious objects and stipulates that the design "minimize" the hazard. The TSO requires the seat design to be "free of pinching and/or shearing effects", and 14 CFR § 25.785(b) requires the seat be designed so that a person making proper use of it "will not suffer serious injury in an emergency". Even though there is a difference in the wording between the TSO MPS and 14 CFR ⇓ 25.785(b), compliance with the MPS of the TSO is consistent with the rule, and the result is the same. SAE ARP5526 section 3.11.2 provides a satisfactory method for determining compliance to both the TSO and the rule. However, the term "minimize" as used in SAE ARP5526 section 3.11.2, is inappropriate to justify a design by only reducing the number of potentially injurious features, or to assess the probability that a person would contact such features on any given flight.

Certain sections of SAE ARP5526 are not applicable or are inadequate to use for showing compliance to either the TSO or 14 CFR part 25 and are listed as "not applicable" in Table 1. There are also sections of SAE ARP5526 on topics for which the FAA is developing policy. In those cases, the criteria in SAE ARP5526 are acceptable and the soon-to-be-released policy may provide added means for meeting the TSO and the applicable airworthiness regulations. An asterisk '*' identifies those topics.

We recommend ACO Managers forward this memorandum and attachment to all holders of TSO-C39b, TSO-C127 and TSO-C127a under their purview and any other appropriate industry representatives. Address all questions on this memorandum to Hal Jensen, AIR-120, (202) 267-8807 or Jeff Gardlin, ANM-115, (425) 227-2136.

David Hempe
Manager
Aircraft Engineering Division, AIR-100
Aircraft Certification Service

Vi Lipski
Manager
Transport Airplane Directorate, ANM-100
Aircraft Certification Service

Table 1: Summary of SAE ARP5526 Guidance Applicability

Topic	The guidance in ARP5526, paragraph:	can be used to comply with TSO-C39b, NAS 809, paragraph:	can be used to comply with TSO-C127, AS8049, paragraph:	can be used to comply with TSO-C127a, AS8049 Rev. A, paragraph:	can be used to comply with Title 14 CFR, section:	can be used to comply with the specific policy or guidance listed below:
Seat Back Handhold	3.1.2	Not applicable	Not applicable	Not applicable	Not applicable	
Seatbelt Misalignment	3.2.2, 3.2.3	4.1.3	3.1.11, 3.2.3 for restraint system	3.1.11, 3.2.3 for restraint system	25.601	
Life Vest Retrieval	3.3.2	Not applicable	3.1.8	3.1.20	25.1411, 25.1541	
Friction Fit Components	3.4.2	Not applicable	Not applicable	Not applicable	Not applicable	
Hinged Aisle Armrests – Discreet Latch *	3.6.2	Not applicable	Not applicable	3.2.14	25.789, 25.815	AC 25-17A (pending)
Baggage Bar Loading	3.7.2	Not applicable	3.2.7, 5.1.7	3.2.7, 5.1.7	25.787	AC 25-17 Para. 102(b)(2)
Seat Safety Placards	3.8.2	Not applicable	Not applicable	3.1.20 a, 3.2.7	25.811 (f)(2), 25.1411(b)(1), 25.1541	AC 25-17 Para. 1041(b)(1)
Literature Pocket Stowage Capacity	3.9.2	Not applicable	5.1.7, 5.1.9, 5.3.5.1	5.1.7, 5.1.9, 5.3.5.1	25.601, 25.787(a), 25.789(a)	
Tray Table Latch Retention	3.10.2	Not applicable	Not applicable	Not applicable	25.813	
Finger Pinch	3.11.2	Not applicable	Not applicable	3.1.17	25.601, 25.785	
Sharp Edges	3.12.2	Not applicable	3.1.15	3.1.15	25.601, 25.785	
Delethalization of Seat Features *	3.13.2	4.1.4	3.1.15, 3.2.1, 3.2.2	3.1.15, 3.1.18, 3.1.19, 3.2.1, 3.2.2	25.601, 25.785	Letter TAD-96-002 Appendix A Policy memo in process
Seat Features Adjusted With/Without Tools	3.14.2	Not applicable	3.2.3	3.2.3	25.561, 25.789, 25.813	
Legrest and Footbar Retention	3.15.2	Not applicable	3.2.6	3.2.6	25.789, 25.813	
Emergency Escape Path (Proximity) Lighting	3.16.2	Not applicable	Not applicable	Not applicable	Not applicable	
Rotating Armrests	3.17.2	Not applicable	Not applicable	Not applicable	25.785	AC 25-17 (14 CFR PART 25.785) guidance (5) Para. (c)(2)

* Additional guidance pending